

MUS. COMP. ZOOLOGICAL
LIBRARY

MAR 18 1985

HARVARD
UNIVERSITY

B R E V I O R A

Museum of Comparative Zoology

US ISSN 0006-9698

CAMBRIDGE, MASS.

29 APRIL 1983

NUMBER 475

**NEW OR PROBLEMATIC *ANOLIS* FROM COLOMBIA.
I. *ANOLIS CALIMAE*, NEW SPECIES, FROM THE
CLOUD FOREST OF WESTERN COLOMBIA**

STEPHEN AYALA,¹ DENNIS HARRIS,² AND ERNEST E. WILLIAMS³

ABSTRACT. *Anolis calimae*, new species, is described from the cloud forest of western Colombia in Departamento Valle del Cauca. Referable to the *Anolis punctatus* species group, it is distinctive in its coloration, in the absence of an interparietal scale, and in the apparent trend to reduction of the elongate anterior supraciliary scale usual in *Anolis*.

INTRODUCTION

In a recent paper (Williams, 1982), the description of three new species was made the occasion of a summary of the eastern members of the *punctatus* species group. Several new species must be described before a similar summary will be possible for the western *punctatus* group. The first is here described, a small species and initially recognized only from a single specimen collected in cloud forest near Lake Calima. Even with one specimen, its striking color pattern and distinctive habitus made it obvious that it is a new species. Subsequently, three additional specimens have been obtained, one from the original locality, two from Television Tower Mountain near Cali. These four specimens have been divided between the Museum of Comparative

¹120 Vista View Place, Petaluma, California 94952.

²Museum of Zoology, University of Michigan, Ann Arbor, Michigan 48109.

³Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts 02138.

Zoology and the Instituto de Ciencias Naturales (ICN, Bogotá). Still more recently a Museo La Salle (MLS, Bogotá) specimen from a third locality has been recognized as belonging to this species. At the suggestion of Fernando Castro, we call it after the place of its first discovery:

Anolis calimae, new species
(Figs. 1-6)

Type: MCZ 158392, adult male.

Type locality: San Antonio, Television Tower Mountain, Depto. Valle del Cauca, Colombia, (3° 28'N 76° 40' W) 1,800 m elevation, Dennis Harris, Humberto and Fanny Carvajal, coll., 23 January 1980.

Paratypes (all from Valle): MCZ 158393, adult female, same data as type; ICN 3678, adult female, approx. 1 km below Lake Calima dam, (3° 50'N 76° 32'W) Dennis Harris, coll., 18 January 1980; ICN 3679, adult male, same place as ICN 3678, William Duellman and Fernando Castro, coll., 17 March 1979. MLS 122: Mares, 3 km N of San Antonio (3° 30'N 76° 40'W).

Diagnosis. A small green cloud forest species of the *punctatus* group distinguished by its short body, legs and tail, *consistent absence of the interparietal scale*, a blunt and weak canthal ridge with poorly differentiated canthal scales, only a short supraciliary scale followed by granules or granules only, small, low number of loreal scales (4-5), smooth ventrals and very short stubby toes with 15 to 17 lamellae under phalanges ii and iii of fourth toe. Dewlap present in both sexes, small in female and *with larger scales*.

Description. Head. Rather short. Head scales small, flat, very slightly wrinkled. Seven to ten scales across the snout between the second canthals. Frontal depression shallow, the scales within it as large or larger than some of those anterior to it. Four to seven scales border rostral posteriorly. Circumnasal scales of each side separated from rostral by one elliptical scale which lies above the suture between rostral and first supralabial. Six scales between supranasals dorsally. Snout elongate, slightly protuberant, extending slightly beyond mental.

Supraorbital semicircles separated in both males by two rows of large scales, as large as the scales of the semicircles, in the females in contact or separated by one row of small scales or granules. Supraor-



Figure 1. *Anolis calimae*, new species, in life. Female paratype above, male type below.

bital scales in contact with or barely separated from the supraocular disk of each side, which consists of six to ten enlarged, slightly wrinkled scales, remainder of the supraocular area granular or subgranular. One or two short supraciliaries on each side followed by granules, or *only granules present*. Canthus blunt, canthals small, poorly differentiated, the first or first and second largest. Loreal rows four or five, the lowermost slightly larger.

Temporals granular. An indistinct intertemporal double line of slightly enlarged scales. Supratemporals granular laterally, becoming larger and flattened toward the interparietal area, which is bounded by weak ridges. *No differentiated interparietal*, but a zone of enlarged scales, largest anteriorly and laterally, posteriorly grading slowly into the dorsal granules. Ear opening small, elliptical, but larger than any scale in the interparietal area. Occiput with small blunt median knob, obvious in males, not evident in females.

Suboculars in contact with supralabials. Seven supralabials to the center of the eye.

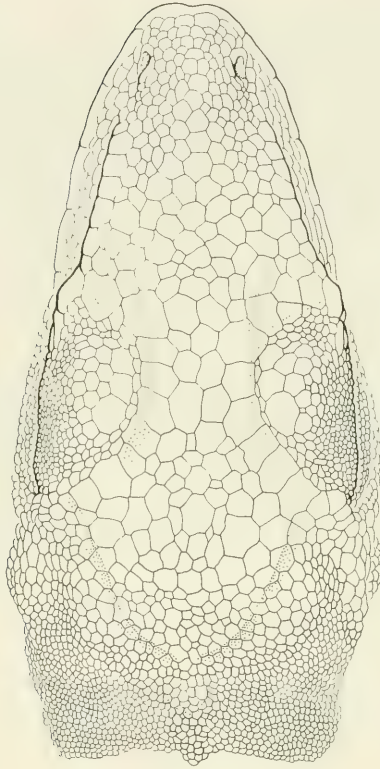


Figure 2. *Anolis calimae*, new species. Male type, MCZ 158392. Dorsal view of head.

Mental semidivided, each part slightly or distinctly wider than deep. Four granules are in contact with the mental between the large first sublabials. Two to five sublabials in contact with the infralabials. Gular scales subgranular, very little enlarged laterally where they border the sublabials.

Trunk. Dorsal scales granular, convex, subequal. Ventrals much larger, smooth, juxtaposed or subimbricate, rounded or slightly pointed in males, broader, squarish in females, in transverse rows. Lateral chest scales not keeled. Males may develop a low nuchal crest when aroused.

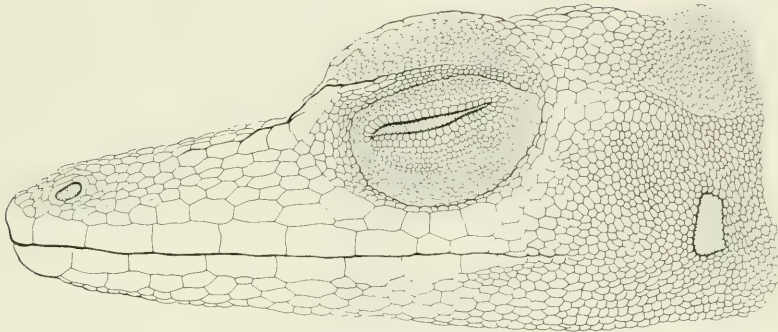


Figure 3. *Anolis calimae*, new species. Male type, MCZ 158392. Lateral view of head.

Dewlap. Present in both sexes. Large in male, reaching anterior abdomen, scales small, smaller than ventrals, weak, in rows, one scale wide, separated by naked skin, edge scales larger, somewhat crowded, imbricate, smooth; small to moderate in females, *scales larger*, as large or larger than ventrals, in close-packed rows, smaller and much more numerous along the edge.

Limbs and digits. Upper arm scales granular. Lower arm scales granular to larger and uncarinate. Leg scales granular posteriorly, larger and uni- to multicarinate anteriorly. All supradigital scales multicarinate. Toes relatively short and stubby. Digital dilations moderately wide. Fifteen to 18 scales under phalanges ii and iii of fourth toe.

Tail. Compressed, short, ca. 1.5 X body length, possibly prehensile. No tail crest. Two weakly keeled middorsal rows, ventral rows larger and more strongly keeled, verticils not evident. Scales posterior to vent smooth. Large postanals in males, none in females. Tail base prominently swollen to accommodate hemipenes in adult males.

Size. *Anolis calimae* is a small but somewhat robust species. Sizes of the four recent specimens are: 59 (type), 58, 55, and 58 mm snout-vent length respectively.

Color. This is a green anole with a considerable capacity for rapid pattern and color change. It may be almost uniform green or yellow-green with little or no pattern, or it can have three prominent broad

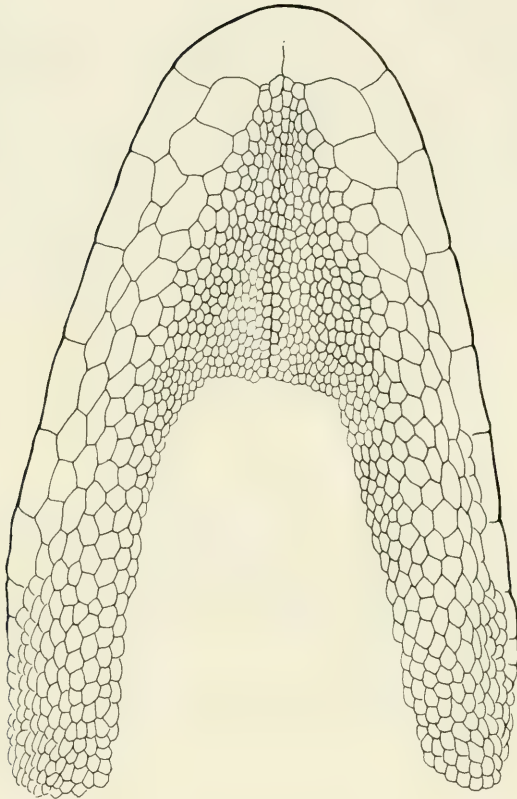


Figure 4. *Anolis calimae*, new species. Male type, MCZ 158392. Ventral view of head.

black bands across the back and sides (apparently more prominent in the males), with pale yellow or cream colored spots in the dark bands. At another state of excitement, the sides and back are mostly green-grey with scattered small black spots on the sides and neck and a few dark brown crossbars on the vertebral line. Females especially may show alternating sets of narrow, light yellow and dark brown-black spots along the midline. There is no prominent dark band across the head between the eyes. The large male dewlap is unpigmented: pale yellow-green with salmon pink near anterior edge and white or pale



Figure 5. *Anolis calimae*, new species. Male type in lateral view.

yellow scales. The small female dewlap is pigmented: blue with yellow or white scales. The tail is banded: broad dark bands in the male and narrow bands in the female. The lining of the throat is pale. The iris of ICN 3678 (a female) was golden yellow above and below a zone of orange; that of the holotype male, MCZ 158392, was orange.

Preserved specimens are greenish-grey with few to many small but prominent dark (and light in the male) spots on the back and sides, elongate dark and light spots along the dorsal midline and a darker brown, unpatterned head. The belly is pale, with small grey spots under the chin. The dewlap has rows of white scales over white skin (males) or pigmented skin (females). The peritoneal lining is heavily pigmented.

Habitat and reproduction. The two recent collection sites are about 50 km apart in the same cloud forest region (tropical premontane wet forest) in the western Colombian cordillera. All four specimens were collected at night while they were sleeping in exposed sites 40 to 150 cm above the ground, the type and first paratype on a fern leaf and a low shrub, in a cool forested region at about 1,800 m elevation. The two Lake Calima paratypes were on exposed twigs, in a somewhat warmer, more densely vegetated area also subject to frequent rains and cool fogs at 1,300 m elevation. Other anoline species known to occur in the same sites or in the same general area are *A. ventrimaculatus*, *A. eulaemus*, *A. fraseri*, *A. antonii*, *Phenacosaurus heterodermus* and an undescribed *punctatus* group anole known at present from a single specimen.

The specimens were in reproductive condition at the time of capture: the males with enlarged testes (6.1 x 4.0 mm approx.), and the females with a single oviducal egg on one side and an enlarged, yolking follicle on the other.

Etymology. The name *calimae* refers to the site where William Duellman and Fernando Castro collected the first specimen. Lake Calima is in turn named after the Calima Indians who inhabited the region centuries ago.

Comparisons. *A. calimae* is a very distinctive anole. No previously described member of the *punctatus* group is known to lack an interparietal scale. This condition is unusual in any group of *Anolis*, but it is curious that it is known as a moderately common variation in two species of the *aequatorialis* species group (*A. ventrimaculatus* and *A. gemmosus*) which, like *calimae*, are inhabitants of Andean cloud



Figure 6. *Anolis calimae*, new species. Female paratype in lateral view.

forest. It is possible, since there are only four specimens of *calimae* thus far known, that absence of an interparietal will be found to be inconstant in this species too.

The wholly granular supraciliary margin found in one specimen of *calimae* is unique, not only for the *punctatus* group, but for the genus *Anolis*. The alternative and commoner condition (in three of the four *calimae*) of one elongate but short supraciliary scale is known elsewhere (e.g., in the *tigrinus* species group); the extreme shortness of the scale in the three specimens may, however, be indicative of a strong trend toward de-differentiation of this scale, which then culminates in the completely granular margin.

The presence of a dewlap in both sexes, and the fact that it is smaller and differently pigmented in the female, may be a primitive feature of *calimae* and occurs erratically in a number of *Anolis* species groups. In the *punctatus* group the condition is known in *chocorum* and in *transversalis*, and in these species, as in *calimae*, is associated with a more or less marked difference in body color and pattern between the sexes.

Unique to *calimae* is the larger size of the dewlap scales in the female. The reverse or equal-sized scales is typical for *Anolis* species in which the female retains a dewlap.

Unusual also and requiring confirmation by additional material is the apparent difference between males and females of *calimae* in the size and number of scales between the supraorbital semicircles.

From the two other previously described *punctatus* group species of western Colombia *A. calimae* is as distinctive in color as in scales. Both these species are also Pacific lowland forms: *Anolis chocorum* (also a larger species, reaching 79 mm snout-vent length) has the dorsum uniform green or with oblique rows of dark green blotches on the flanks, never with prominent black bands enclosing yellow or cream spots. The male dewlap is orange laterally, green basally; or the female dewlap is green with pale yellow or gray at the base. The rows of scales in the dewlaps are three to four scales wide. *Anolis chloris* (about the same size as *A. calimae*, ca. 55 mm snout-vent length) is grass-green in color, with the potentiality of turning a dark olive green which then may have diagonal darker bars, but again there are never the black bands of *calimae*. The dewlap color in males is yellow or white, never green, the rows of scales in the dewlap are one scale wide and there is no dewlap in the female. In contrast to *A. calimae*, both *A. chocorum* and *A. chloris* turn blue or purple in preservative

rather than the greyish green of *A. calimae*. The occiput knob is not seen in *A. chocorum* or *A. chloris*.

There has been no evident close relative for *A. calimae*. However, an undescribed species from the same region, known only from a juvenile male, seems closer than any other, although still sharply distinct.

ACKNOWLEDGMENTS

We are grateful to the collectors of the species here described, William E. Duellman, Humberto and Fanny Carvajal, and Fernando Castro. Ayala's work in Colombia was sponsored by grants from the U.S. Public Health Service (NIAID AI-A21511), Tulane University (NIAID AI-10050), and COLCIENCIAS, the Colombia National Science Institute. The drawings are by Laszlo Meszoly.

LITERATURE CITED

- WILLIAMS, E.E. 1982. Three new species of the *Anolis punctatus* complex from Amazonian and inter-Andean Colombia, with comments on the eastern members of the *punctatus* group. *Breviora Mus. Comp. Zool.* No. 467, pp. 1-38.